**Project 2: Determining Plant Water Stress Damage Point of Fittonia HousePlant via Wilting Metrics From Multiple View Images**

PURPOSE

* Growing demand for more water efficient systems to reduce water consumption
* Early detection of plant stress is very important to ensure better growth and yields of all plants
* Demand for research in the field of stress detection in plants of different species. Current research is lacking and applies only to specific species.
* (Results of this project can be applied to water stress detection in other types of plants)

DATA ACQUISITION

* If enough appropriate photos are found online of plants being watered at different intensities and the effect of the different watering methods over time on the plant, then these photos will be used. If not:
  + Buy 10 fittonias (or pothos or similar plants). Plants will be watered at 4 different levels: heavily overwatered, not watered, watered the appropriate amount, underwatered. (maybe instead of overwatered have another level of underwatered) 8 will be used for determining the parameters of the algorithm. 2 will be used for testing of said algorithm. Take photos twice daily using a similar method as in Yang, Baireddy, and Cai’s Image-Based Plant Wilting Estimation paper.

METHOD

* Determine plant wilting intensity
  + Using initial processing, color and shape based metrics, and stem based metrics in Yang, Baireddy, and Cai’s Image-Based Plant Wilting Estimation paper
  + Using clustering to identify individual plants and track density of clusters over time (More dense = wilting less, less dense = wilting more) -> for top view

DATA ANALYSIS

* Relationship between wilting and future substantial water stress damage
* **Find the point where the amount of early onset wilting indicates future water stress damage to the plant.**

TIMELINE

10/18-10/25

* Begin acquiring plant images OR purchase plants needed for data and start taking photos
* Begin developing algorithm to track density of clusters
* Begin recreating initial processing, color and shape based metrics, and stem based metrics in in paper

10/25-11/01

* Finish acquiring plant images OR continue taking photos
* Continue recreating initial processing, color and shape based metrics, and stem based metrics in in paper in paper
* Continue developing algorithm to track density of clusters

11/01-11/08

* Continue taking photos
* Finish developing algorithm to track density of clusters
* Finish recreating initial processing, color and shape based metrics, and stem based metrics in in paper in paper
* Tweek water stress detection methods

11/08-11/15

* Continue taking photos
* Data analysis
* Begin writing thesis
* Send Professor Ahuja very rough draft of thesis

11/15-11/18

* (continue leftover research work if needed)
* Finish rough draft of thesis

11/18-11/29

* (continue leftover research work if needed)
* Finish rough version of oral presentation

11/29-12/06

* Finish final version of oral presentation

12/06-12/12

* Finish final draft of thesis